

Agricultural Medicine Course June 9-13

Vol. 20, Issue 2 - April 2014

The Great Plains Center for Agricultural Health will host *Agricultural Medicine: Occupational and Environmental Health for Rural Health Professionals* June 9-13 at the University of Iowa. The course provides the information and skills needed to enable health and safety professionals to anticipate, recognize, and prevent occupational illnesses and injuries among members of the agricultural community. Topics include agricultural injury, zoonotic diseases, behavioral health issues, ergonomics, cancer in the farm environment, musculoskeletal disorders among agricultural workers, and other agricultural safety and health topics. In addition to the classroom setting, the participants will tour Amana Farms. The course brochure is available at http://cph.uiowa.edu/gpcab/training/Iowa_Core_Course.html and online registration is through the UI Center for Conferences at <https://www.continuetolearn.uiowa.edu/UIConferences>. Additional Agricultural Medicine courses will be held this year in Alabama, Nebraska, and Texas.



For course information and scholarship opportunities visit <http://cph.uiowa.edu/gpcab/training> or contact Kay Mohling at 319/335-4219 (kay-mohling@uiowa.edu).

Stay Safe When Using Pesticides

by Fred Gerr, MD

Pesticides are a broad group of products designed to control insects, weeds, rodents, fungus, and other pests. With the development of biotechnology (GMO) crops and integrated pest management approaches, use of some of the most toxic pesticides has declined in the upper Midwest over the past several years. Still, harm to farmers and farm workers from unprotected exposure to pesticides remains an important and preventable health problem. Of special concern in the upper Midwest is the recent development of western corn rootworm populations resistant to Bt (*Bacillus thuringiensis*) corn, and the potential for increased use of organophosphate pesticides in order to control this destructive insect.

Pesticides can enter the body by direct contact with the skin, inhalation of contaminated air, or swallowing. The majority of pesticides that enter the body during spray application are absorbed directly through the skin. To prevent pesticide exposure, applicators should use approved pesticide handling methods and appropriate personal protective equipment. Pesticide manufacturers and dealers provide specific and detailed pesticide handling information; all applicators should be familiar with these recommendations and follow them carefully.

Pesticide labels often recommend the use of waterproof or chemical resistant gloves to minimize skin contact. However, waterproof gloves are not necessarily chemical resistant. Chemical resistant gloves are available in a variety of materials; make sure to select gloves that are approved for the particular pesticide being used. Never wear cotton, canvas, or leather gloves when applying pesticides, and remember that glove size and material thickness are important considerations for comfort and durability.

Preventing contact of pesticides with the eyes and face requires use of indirectly vented or non-vented goggles and face shields. Safety glasses are not considered effective for protection of the eyes from chemical splash and spray. A full-face respirator is an acceptable substitute for goggles or a face shield.



Fred Gerr, MD

(continued on page 3)

Farm injury rates among children younger than age 10 are on the rise, despite a continued overall decline in the rate of childhood agricultural injuries in the U.S. These trends are highlighted in the **2014 Childhood Agricultural Injuries Fact Sheet** compiled by the National Children's Center for Rural and Agricultural Health and Safety at the Marshfield Clinic Research Foundation. The fact sheet is available for download at www3.marshfieldclinic.org/proxy/MCRF-Centers-NFMC-NCCRAHS-2014_Child_Ag_Injury_FactSheet.1.pdf.

The Census of Fatal Occupational Injuries (CFOI) data have been collected by the Bureau of Labor Statistics (BLS) since 1992. The data contain information on fatal occupational injuries, intentional and unintentional, occurring in the U.S. Various sources of information are used to verify work-related fatalities such as death certificates, workers' compensation reports, news media, government agency reports, and private sources. The data contain more than 30 elements, including circumstances surrounding the incident and the machinery/equipment involved. The Great Plains Center for Agricultural Health (GPCAH) established a sharing agreement with the BLS to present these data. The GPCAH CFOI Report includes 1,452 agricultural fatalities from 2005 through 2010 that occurred in 12 Midwest states. CFOI data is protected at the individual level so that no individual or small groups can be identified. The Report, accompanying slides, and interactive map are available on the GPCAH website at <http://cph.uiowa.edu/gpcab/center-projects/surveillance/index.html>.

Heaters in Animal Feeding Operations - continued from page 4

exhausted gas-fired heaters. However, using heaters with reduced CO₂ emissions can significantly reduce wintertime concentrations of CO₂ in swine farrowing rooms.

We recommend that swine producers using gas-fired heating units use only units that vent exhaust combustion gases outside of the building. Replacement is in order if room concentrations exceed the 1540 ppm CO₂. Additional information is available on the Great Plains website at <http://cph.uiowa.edu/gpcab/center-projects/exposure-CAFOs.html>.

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Farm Families Alive & Well is published 4 times per year
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Pesticide Surveillance Report Released

by Kathy Leinenkugel, MPA, REHS, MT

The Iowa Department of Public Health (IDPH) Occupational Health and Safety Surveillance Program (OHSSP) has released a five-year pesticide surveillance report of occupational poisonings in Iowa. Under Iowa Administrative Code, human pesticide exposures are required to be reported to IDPH by all medical personnel, but the majority of reports come to the IDPH through the Iowa Statewide Poison Control Center (ISPCC). Out of the thousands of ISPCC reports reviewed by IDPH from 2008 through 2012, an average of 66 cases per year met the strict criteria to be included in the data for work-related pesticide poisoning.

Applying, mixing, transporting and disposing of pesticides were the most common activity during the exposure. Sixty percent of the exposures had a contributing factor of not wearing appropriate personal protective equipment. Almost half (47%) of the cases went to an emergency room for evaluation, and another 39% used poison control advice as the only medical treatment.

Disinfectants accounted for over 60% of the pesticide exposure cases reported to IDPH. An exposure causing some type of health reaction to the skin, eye, or respiratory track, but resolved without medical treatment, made up 82% of the cases. Twenty-six percent of reports had signs or symptoms related to the eyes, followed by 23% for the respiratory system, and 22% for the skin.

The 2008-2012 Occupational Pesticide Report is available at www.idph.state.ia.us/LPP/Pesticide.aspx. To receive periodic updates from IDPH OHSSP send a blank email (no subject line, no text in body) to join-idph_ohssp@lists.ia.gov.

Kathy Leinenkugel is the Coordinator of the Occupational Health & Safety Surveillance Program at the Iowa Department of Public Health. She can be reached at 800/972-2026 (kathy.leinenkugel@idph.iowa.gov)

Pesticide Safety Education at Iowa State University

by Kristine Schaefer, PhD

Iowa State University Extension and Outreach's Pest Management and the Environment (PME) program provides educational information throughout Iowa on the safe and effective use of pesticides. Each year the PME program trains approximately 15,600 private and 10,000 commercial pesticide applicators. Topics covered rotate on a three-year cycle and address issues such as personal protective equipment, storage and handling of pesticides, pesticide labels, laws and regulations, sprayer calibration, drift reduction, best practices for protecting water quality, and pest management concerns. Emphasis areas this year are water quality, phytotoxicity, and pesticide stewardship.

Pesticide safety courses are routinely evaluated by participants. In a post-training evaluation of the 2012-2013 private pesticide applicator training program, 97% of the respondents rated the program as excellent or good, and 96% agreed that the information presented was useful for their farm operations. To determine a program's anticipated impact on the participants' work methods, evaluations often examine specific areas to assess behavioral changes towards safer pesticide use practices. Close to 100% adoption of safer practices has been recorded for many different areas of pesticide use.

The PME program also provides training material for compliance with Worker Protection Standards and has an online Train-the-Trainer course (www.extension.iastate.edu/workerprotection). The current Worker Protection Standards are under revision by the EPA; proposed changes can be viewed and commented on at www.epa.gov/oppead1/safety/workers/proposed/index.html.

Additional information on the PME pesticide safety education program, Worker Protection Standards and emerging pest management issues can be found at www.extension.iastate.edu/PME.

Dr. Kristine Schaefer is program manager of the Pest Management and the Environment program at Iowa State University. She can be reached at 515/294-4286 (schaefer@iastate.edu).

Stay Safe When Using Pesticides - continued from page 1

Pesticide applicators may also need body protection to prevent absorption of pesticides by skin on the arms, legs and torso. Body protection may vary from fabric (cotton or polyester) coveralls (for low toxicity agents) to impermeable coveralls appropriate for highly toxic products. Again, the applicator should make the selection of protection based on recommendations made by the pesticide manufacturer.

Because pesticides can enter the body by inhalation, respiratory protection is often necessary to protect farm workers. Respirators designed to reduce exposure to airborne contaminants vary from simple half-face masks, available at home improvement stores, to highly sophisticated self-contained breathing equipment used by firefighters. Respirators are only effective when they fit correctly and are selected to control exposure to specific hazardous agents. Proper respiratory protection is complex and is often best accomplished after consultation with a specialist.

Additional respiratory protection information is available through the Great Plains Center for Agricultural Health (<http://cph.uiowa.edu/gpcah>), the Iowa State University Pesticide Safety Education Program (www.extension.iastate.edu/PME), pesticide manufacturer websites, or field representatives.

Dr. Fred Gerr directs the GPCAH, housed in the Department of Occupational and Environmental Health of the College of Public Health. He can be reached at 319/335-4212 (fred-gerr@uiowa.edu).

calendar

May 12-16

Agricultural Medicine Training
Tuscaloosa, AL
<http://cph.uiowa.edu/gpcah/training>

May 14-16

National Farmworkers Health Conference
Delray Beach, FL
<http://meetings.nachc.com/c-training/national-farmworkers-health-conference/>

May 15

Occupational Health Symposium - Ergonomics & Safety
Cedar Rapids, IA
<http://cph.uiowa.edu/heartland/cc/courses.asp>

May 16

Occupational Health Symposium - Occupational Medicine & Occupational Health Nursing
Cedar Rapids, IA
<http://cph.uiowa.edu/heartland/cc/courses.asp>

June 9-13

Agricultural Medicine Training
Iowa City, IA
<http://cph.uiowa.edu/gpcah/training>

June 22-26

ISASH Annual Conference
Omaha, NE
<http://isash.org>

July 8-11

Agricultural Medicine Training
Omaha, NE
<http://cph.uiowa.edu/gpcah/training>

August 26-28

Farm Progress Show
Boone, IA
www.farmprogressshow.com

September 9-11

Husker Harvest Days
Grand Island, NE
www.huskerharvestdays.com

October 19-22

Safety & Health in Agricultural & Rural Populations: Global Perspectives
Saskatoon, SK, Canada
www.sharp2014.usask.ca

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Research to Practice

Heaters in Animal Feeding Operations

by Renée Anthony, PhD, MSEE, CIH, CSP

The air quality in concentrated animal feeding operations is associated with adverse respiratory health of workers, including decreases in lung function over a work shift and increases in signs of bronchial inflammation and airflow obstruction. Important contaminants in these environments are dust, ammonia, and carbon dioxide (CO₂). In the Midwest, the build-up of these contaminants is greatest in the winter, when fresh air into these buildings is minimal due to the expense of heating cold outdoor air. Researchers in the University of Iowa's Great Plains Center for Agricultural Health are investigating low cost methods to improve the air quality in animal production buildings to improve the health of workers, which may also serve to improve production.

Initial phases of this work have included modeling room concentrations in a farrowing barn over a winter season using different air handling systems, including air pollution control equipment. While dust concentrations are easily controllable to levels below 0.23 mg m⁻³ (respirable dust), limited control options exist for controlling concentrations of gases, particularly CO₂, which is generated by both animal respiration and gas-fired heaters used to maintain adequate production temperatures. Reducing CO₂ by diluting the barn air with fresh air resulted in additional heating to maintain temperatures suitable for sow and piglets. The additional heating operation caused room CO₂ concentrations to increase back to levels associated without using fresh air to dilute CO₂. Using modeling, we could identify no way to use ventilation to reduce CO₂ below 1540 ppm, an industry-recommended room concentration, when using traditional in-room



A CO₂ monitor reads concentrations in a swine barn.

(continued on page 2)